

Spaceport News

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A look back at Kennedy Space Center in 2005

Historic STS-114 mission, new exploration architecture highlight successful year

*By Jim Kennedy
Center Director*

Two-thousand five was an incredible year unlike any other in our Center's history. It culminated with a 'touchdown' by our team that never meant more on Aug. 9 when the STS-114 crew and space shuttle Discovery landed safely at NASA's Dryden Flight Research Center.

This completed a spectacular mission that included breathtaking orbital maneuvers and a first-of-its-kind spacewalk repair.

Our team at KSC contributed to the success of this mission in so many ways, from processing the vehicle to launching Discovery July 26 and recovering it after landing. Our International Space Station payload processing team's contributions ranged from preparing the critical Control Moment Gyroscope for flight to processing the much

needed resupplies that made the ISS "like new" again.

And at year's end, with a great deal of hard work, the Space Station Processing Facility team had 10 station components ready for flight. These remarkable feats have laid the groundwork for a new journey that will take U.S. astronauts back to the moon, then to Mars and beyond.

The space shuttle and ISS teams were joined by many others when it came to creating success stories. The Launch Services Program had several reasons to celebrate a successful year. The Deep Impact mission, launched Jan. 12, came to a successful end by creating amazing fireworks when it collided with Comet Tempel 1 in the early morning of July 4.

The team also successfully launched the DART mission April 15 aboard a Pegasus rocket at Vandenberg AFB, Calif. And for the first time an Atlas V, after years of very technical certification review and approval, was used by the Mars Reconnaissance Orbiter to begin its journey to the red planet Aug. 12.

The orbiter will examine future potential landing sites on Mars once it arrives in March providing high-data rate communications back to Earth. Now we are just days away from the launch of the New Horizons mission to Pluto in early January which will use the Atlas V 500 series for the first time.

January 14 marks the two-year anniversary when President George W. Bush announced the nation's Vision for Space

Exploration. To prepare for our center's role in implementing this new initiative, KSC implemented its Exploration 2005 reorganization in October to structure our capabilities to launch vehicles going back to the moon.

This effort will smoothly transition both the space shuttle's retirement and space station phase out to a new era supporting the future Crew Exploration Vehicle.

While we're proud of all these tremendous accomplishments, this was also a banner year for our institutional support teams. A sign of a vibrant center is watching new programs and facilities come to life.

This was represented by such events as the opening of the new Operations Support Building II that will serve as the work place for hundreds of workers. It was joined on the operations side by the Shuttle Landing Facility's new control tower, giving our aircraft controllers and weather personnel a state-of-the-art facility.

In the training arena, our new KSC Learning Center will serve as the new home of our in-house training programs.



SPACE SHUTTLE Discovery slowly makes its way to Launch Pad 39B as a June sun rises.

Between achieving current program success and laying the steppingstones for a tremendous future, 2005 was an incredible year for KSC.

Now that 2006 is underway, I look forward to working with our tremendous team as we take on the challenges of space exploration for our nation.



**Kennedy Space Center
Director Jim Kennedy**

January

NASA's Deep Impact spacecraft launched on Jan. 12 from Cape Canaveral Air Force Station on its 268-million-mile journey to collide with Comet Tempel 1, reaching its destination July 4 to perform an incredibly complex experiment in space to probe beneath the surface of a comet and reveal the secrets of its interior.

Deep Impact's larger "flyby" spacecraft released a smaller "impactor" into the path of the comet, causing a brilliant impact on July 4. The crater produced

Deep Impact launches on collision course with comet

by the impactor was as large as a football field and more than 10 stories deep.

Comets are time capsules that hold clues about the formation and evolution of the solar system. They are comprised of ice, gas and dust, primitive debris from the solar system's coldest regions that formed 4.5 billion years ago.

Data from the spacecraft's instruments indicated an immense cloud of fine powdery material was released when the probe slammed into the comet's nucleus. NASA's Hubble, Spitzer and Chandra space telescopes, and others on Earth, observed the collision.



NASA's DEEP Impact launched Jan. 12 from Cape Canaveral Air Force Station. The "impactor" spacecraft slammed into Comet Tempel 1 to study its core. Approximately 4,500 images were taken from the spacecraft's three cameras. Dramatic images of the event were relayed to audiences around the world in near real time on NASA TV and the Internet.

February

KSC remembers fallen astronaut crews



Hundreds of people came together for a public memorial service on Feb. 1 to honor the Columbia STS-107 crew at the Space Mirror Memorial at the Kennedy Space Center Visitor Complex. The memorial also honors fallen astronauts from Challenger STS-51L, Apollo 1 and astronauts from training and commercial airplane accidents.

The crew of STS-107

included Rick Husband, Willie McCool, Michael Anderson, Kalpana Chawla, David Brown, Laurel Clark and Ilan Ramon, whose names are inscribed on the Space Mirror Memorial.

At the service, Kirstie McCool Chadwick, sister of Columbia pilot Willie McCool, said her brother had the time of his life when in orbit. "He loved to fly and he loved science," she said. "He was living his ultimate dream."

CENTER DIRECTOR Jim Kennedy and Kirstie McCool Chadwick place a memorial wreath at the base of the Space Mirror Memorial.

Administrator O'Keefe leaves NASA

Sean O'Keefe served his last official day as administrator Feb. 19, following three years of service in which he led the agency through an aggressive and comprehensive management transformation following the Columbia accident.

O'Keefe helped NASA through one of its most painful tragedies, the loss of space shuttle Columbia and its crew. He directed significant changes in the space shuttle's safety and management programs, and was a key architect of the nation's Vision for Space Exploration.

During an all hands meeting Feb. 9 at

the Training Auditorium, O'Keefe was broadcasted live on a new matte white viewing screen as a surprise guest.

"I have been down to visit with so many great colleagues at the Kennedy Space Center over the last several years of my tenure and they are among the highlights of the time I have spent at NASA," O'Keefe said. "I could not be more privileged and honored to be among such extraordinary professionals who are so dedicated to the mission and task we have been asked to do on behalf of the American people."



SEAN O'KEEFE, former NASA administrator, is now chancellor of Louisiana State University.

Centaur program celebrates 41 years of excellence

Employees who contributed to the success of the 41-year Centaur program gathered Feb. 25 for a commemorative ceremony and historical reunion, "Celebrating Centaur: Then and Now," at the Atlas Spaceflight Operations Center. They reminisced about working on the Centaur stage booster, expressing their pride that every NASA spacecraft bound for the outer planets has been launched using a Centaur, with one exception.

The Centaur stage booster, developed by NASA and originally manufactured by General Dynamics, had its first successful launch on Nov. 27, 1963, atop an Atlas booster from Launch Pad

36A.

The Centaur legacy continued in 2005 with the launch of the Mars Reconnaissance Orbiter, and will do so again in 2006 with the launch of New Horizons to Pluto, the outermost planet in the solar system.

Kennedy Space Center Director Jim Kennedy expressed his thanks for the impact of the Centaur program.

"We are here to celebrate the accomplishments of hundreds of men and women who, for more than 41 years now, have seen to it that our nation has the ability to explore the universe," he said. "The Centaur and her team have allowed us to do that. Go Atlas, Go Centaur!"



KENNEDY SPACE Center Director Jim Kennedy praises the current and retired employees who have contributed to the Centaur program's success at a Feb. 25 celebration.

External tank mates to boosters for STS-114 stack

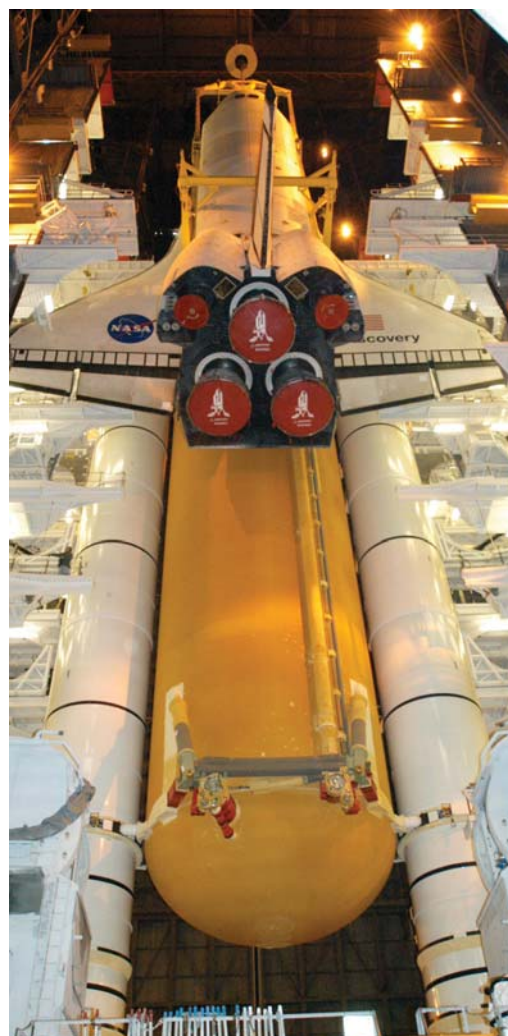


THE REDESIGNED external tank is mated with twin solid rocket boosters in the Vehicle Assembly Building on Feb. 28.

The first major step in assembling the space shuttle for flight took place Feb. 28 with the successful mating of the redesigned external tank and twin solid rocket boosters that would help launch space shuttle Discovery on its return-to-flight mission. The external tank received many safety upgrades, including two new forward bipod fittings connecting the tank to the orbiter at the space shuttle's two forward attachment struts and electric heaters to eliminate ice buildup.

During mating, the left and right boosters (also called SRBs) are bolted to the tank at both the forward, or top, and the aft, or tail ends. At the forward end, a vertical bolt mechanism attaches each booster to the tank. At approximately two minutes into launch, SRB separation begins when pyrotechnic devices fire to break the 25-inch, 62-pound steel bolts.

One half of the bolt is caught in canister-like "bolt catchers" located on the tank; the other half remains with the boosters. Discovery also flew with a modified bolt catcher, which was upgraded from a two-piece welded design to a one-piece, machine-made design.



THE ORBITER Discovery was lowered in front of the solid rocket boosters and external tank on March 29.

March

Kennedy Space Center's technologies helped Virgin Atlantic's GlobalFlyer aircraft set the record for the first solo non-stop flight around the world. On Feb. 28, pilot Steve Fossett began his historical 25,000-mile flight that was transmitted by video through NASA's Space-Based Telemetry and Range Safety project, led by Lisa Valencia.

For Fossett's safety, KSC loaned an upgraded version of its Personal Cabin Pressure Monitor, which recognizes potentially dangerous or deteriorating cabin

Kennedy-developed technology helps GlobalFlyer set world record for flight

pressure conditions and alerts the pilot of the need for supplemental oxygen.

The aircraft is a single-engine model designed for continuous circumnavigation by one pilot and no passengers. It weighs roughly 22,000 pounds when fully fueled and can exceed speeds of 285 miles per hour. The GlobalFlyer has a 114-foot wingspan and uses drag parachutes to slow down on final descent. Once the jet stream and weather conditions were satisfactory for flight, Fossett boarded the small quarters he'd call home for the next 67 hours.



NASA PERSONNEL involved in the historic flight include, from left: Chris Forney, Jennifer Murray and Rich Nelson of NASA KSC; Steve Bundick, NASA Wallops Flight Facility; James Dumoulin, KSC; Philip Grassa, Scaled Composites; Lisa Valencia, Erik Denson, Michael Downs and Dr. James Simpson, all of KSC; Greg Coombs, Honeywell; and Jan Zysko, KSC.

April

Griffin becomes NASA's new leader



NASA ADMINISTRATOR Michael Griffin takes the oath of office during a ceremony at the Office of Science and Technology Policy in Washington.

Mike Griffin became NASA's 11th administrator on April 14, following a nomination from President George Bush in March. Griffin brought to the agency many priorities consistent with the Vision for Space Exploration.

These include bringing a new Crew Exploration Vehicle into service as soon as possible after the space shuttle is retired, and establishing a lunar return program that could help future crews travel to Mars and beyond.

Prior to his nomination, Griffin served as head of the Space Department at Johns Hopkins

University's Applied Physics Laboratory in Baltimore. Earlier in his career, Griffin served as chief engineer at NASA and as deputy for technology at the Strategic Defense Initiative Organization.

As an adjunct professor at Johns Hopkins University, the University of Maryland and George Washington University, Griffin taught courses in spacecraft design, applied mathematics, guidance and navigation, spacecraft attitude control and other aerospace studies. He also wrote the textbook, "Space Vehicle Design."

All American Picnic highlights fun, flight and family

Perfect Florida weather and a combination of delicious food, carnival-style games and great music combined to make the 2005 KSC All American Picnic on April 9 an event participants will remember for years. The motto "KSC and Proud to Be" was evident as employees brought their families to take part in dozens of fun activities and take a bus tour of the center, where they enjoyed the sight of Discovery at Launch Pad 39B.

"The combination of perfect weather, the excitement of

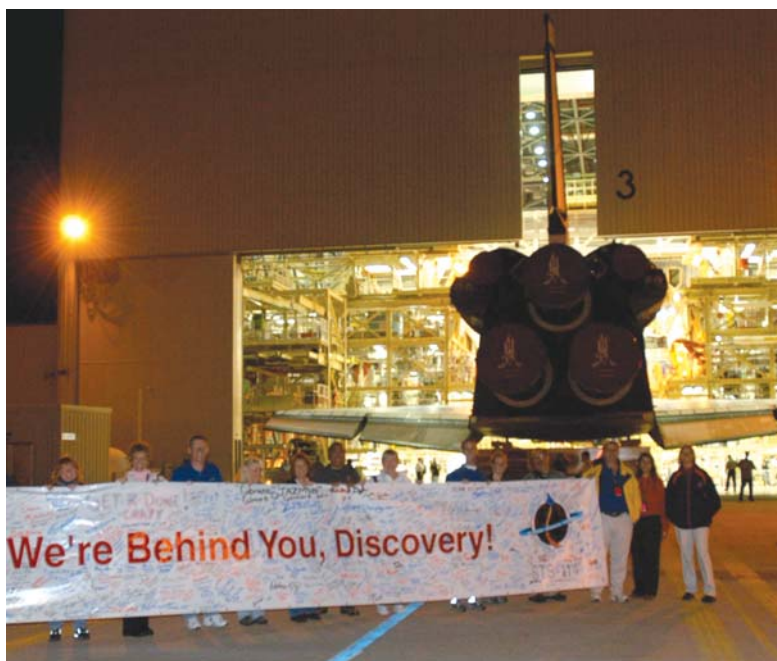
having a space shuttle arrive at the pad three days earlier, and the wonderful support and enthusiasm of the picnic team and numerous volunteers all worked together to make this one of the best picnics ever," said picnic chairman Phil Bennardo of the Spaceport Engineering and Technology directorate.

Shuttle Program Manager Bill Parsons told those at the event's rally how much appreciation he has for the work force. "Jim Kennedy and all the folks at the Kennedy Space Center have done a great job," Parsons said.



CHILDREN ENJOY games at the April 9 KSC All American Picnic.

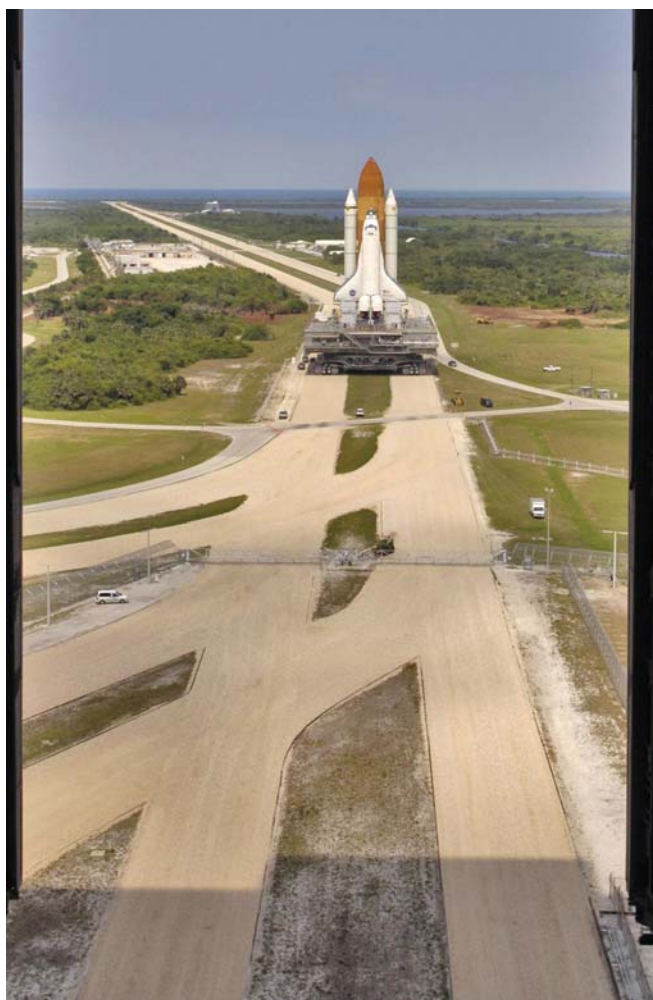
Excitement builds as Discovery travels to launch pad



SPACE SHUTTLE Discovery leaves Orbiter Processing Facility bay 3 as Stephanie Stilson (far right), vehicle manager for Discovery, and her team proudly look on.

The orbiter Discovery's rollover into the Vehicle Assembly Building gave employees a reason to celebrate another major milestone in the march toward returning to flight. After Discovery was mated to the external tank and twin boosters, the space shuttle rolled out to the

launch pad and arrived early April 7 after a slow, four-mile journey that brought feelings of excitement across the center and to viewers watching throughout the nation on TV. The orbiter returned to the VAB May 26 for a new external tank and rolled back to the pad June 15.



DART launches for rendezvous flight experiment



NASA's DART spacecraft - short for Demonstration of Autonomous Rendezvous Technology - is being prepared for its April 15 flight.

NASA's DART mission - short for Demonstration of Autonomous Rendezvous Technology - launched April 15 from Vandenberg Air Force Base, Calif. The spacecraft was a flight experiment attempting to establish autonomous rendezvous capabilities for the U.S. space program.

After a successful rendezvous, acquisition of the target spacecraft, and approach to within approximately 300 feet, DART placed itself in the retirement phase before completing all planned proximity operations, ending the mission prematurely. While previous rendezvous and docking efforts have been piloted by astronauts, the DART spacecraft completed the

rendezvous and acquisition with no human intervention, relying on a variety of sensors and analyses to complete these functions.

The complete mission was designed to last 24 hours. DART hardware and software technologies were integrated into Pegasus, a commercially developed space launch vehicle. The Pegasus, with the DART spacecraft aboard, was launched from its Stargazer L-1011 aircraft 39,000 feet over the Pacific Ocean.

After Pegasus was released with the DART spacecraft, it boosted DART into a low-Earth polar orbit, where it passed over each pole every 100 minutes. The DART spacecraft is about 6 feet long, 3 feet in diameter, and weighs roughly 800 pounds with fuel.

May

The U.S. Astronaut Hall of Fame gained three new American space explorers - astronauts Joseph P. Allen, Gordon G. Fullerton and Bruce McCandless II - during a ceremony at the Saturn V/Apollo Center. KSC Director Jim Kennedy praised the event's theme of achievement and the NASA family. "We are having a family reunion to pause and celebrate the accomplishment of three heroes of the American space flight program," he said.

The first astronaut to be honored was Fullerton, who has flown 144 different planes. After an extensive career test-piloting

military aircraft, he joined NASA as an astronaut and assisted with the final Apollo missions.

Allen was the next astronaut welcomed into the ranks. He worked in various positions within NASA until he was tapped in 1981 to assist with the first space shuttle mission. His first flight came aboard STS-5 in 1982 on a mission to deliver commercial satellites into space.

The final inductee was McCandless. During his early years with the agency, McCandless worked with such notable programs as Apollo and Skylab. The scientist flew on STS-41B in 1984.



THE 2005 U.S. Astronaut Hall of Fame inductees, displaying blue ribbons, are Bruce McCandless (left), Joe Allen and Gordon Fullerton. Next to them are Jim Kennedy (right), director of KSC, and his wife, Bernadette.



NASA Administrator Mike Griffin (right) tours Orbiter Processing Facility bay 1 with Space Shuttle Atlantis Vehicle Manager Scott Thurston.

Griffin praises KSC on first visit as administrator

Michael Griffin expressed his confidence in Kennedy Space Center and his plans for shaping NASA's future during his first visit to the center as NASA's administrator on May 20 at a town hall meeting. "KSC is NASA's launch center . . . and that is KSC's core strength," he said. "You will not be unhappy with KSC's role going forward."

Center Director Jim Kennedy introduced Griffin to a packed audience in the training auditorium and to NASA TV viewers. "He is the person to lead this

agency as we begin the real first steps of exploring this universe of ours," Kennedy said. Griffin said he had visited KSC for at least six launches. "My impression is the same as it always is - talented, dedicated people who know what they're doing," he said.

"That impression hasn't changed, it's only been reinforced." He also discussed the space shuttle's impending retirement date and the Crew Exploration Vehicle.

June

As space shuttle Discovery's launch day neared, several soldiers from the Space Coast who were stationed in Iraq created an inspiring message to show their support for the space program. A banner stating "Go Discovery" was signed by a group of troops, including NASA engineer and U.S. Army Lt. Col. Bill McQuade, and sent to Kennedy Space Center for display. Even though the soldiers were half a world away, the shuttle was close to their hearts.

The banner was inspired by a January meeting McQuade had with the STS-114 astronauts at Kennedy just before deploying to Iraq. He said there is great enthusiasm for shuttle launches and great support for the space program, in general.

LT. COL. William McQuade (top row, second from left), an Army Reservist and KSC employee, and his fellow comrades show their support for Discovery's launch.

Troops in Iraq express support for Discovery



Officers discover lost training spacesuits

Two security officers doing a check of a facility known as the astronaut ready room at the Launch Complex 5/6 museum in June discovered a long-forgotten, locked room that revealed a glimpse of a bygone era. NASA Special Agent Dann Oakland and Security Manager Henry Butler of the company that oversees the museum, Delaware North Parks and Resorts, discovered a locked room - and they had no key.

Using a master key to get inside, they found two retired spacesuits from a short-lived Cold War-era military program to put a manned reconnaissance station in space. The suits were used by Americans who trained in the 1960s to be astronauts aboard the U.S. Air Force orbiting reconnaissance labora-

tory. Begun in 1964, the Manned Orbiting Laboratory (MOL) program was an Air Force initiative that would have sent Air Force astronauts to a space station in a Gemini capsule.

After spending a few weeks in orbit, the crew would undock and return to Earth. The Air Force abandoned the program in 1969, but the program produced a great deal of technological development, and three groups of military officers trained to be MOL astronauts. The spacesuit with identifying number 008 had the name "LAWYER" on the left sleeve. The suit was traced to Lt. Col. Richard E. Lawyer, a member of the first group recruited to be MOL astronauts in 1965. The suit has been sent to the Smithsonian Institution.



DANN OAKLAND, a NASA special agent, holds up the spacesuit he found at Launch Complex 5/6.

July

The world watches STS-114's first countdown



With the world watching, NASA scrubbed its first STS-114 launch attempt on July 13 when a sensor failed a routine prelaunch check. "This team is energetic and we will conquer this problem, too," explained former Space Shuttle Program Deputy Manager Wayne Hale shortly afterward.

Following the first launch attempt, managers and engineers studied the problem with a liquid hydrogen low-level fuel sensor inside the external tank. The sensor failed a routine prelaunch check during the launch countdown. A dozen teams, with hundreds of engineers across the country, worked on the issue. The launch scrub, which

even further underscored NASA's dedication to space flight safety, was covered by more than a thousand media representatives from 32 countries and 36 states in America.



At left, the STS-114 crew exits the Operations and Checkout Building on July 13 before the faulty sensor scrubs the launch. Above, Lloyd Pierce, a NASA test engineer, checks components related to the faulty sensor reading.

NASA's historic return to flight is vision's next step

Thousands of people who gathered to watch Space Shuttle Discovery's historic return-to-flight launch July 26 loved hearing the roar of liftoff, but the entire STS-114 mission also caused a thunderous clap: the applause of the world.

The crew's successful 12-day mission to the International Space Station ended a two-and-a-half-year wait, and Discovery safely returned to Earth on Aug. 9. Astronauts tested new techniques and equipment designed to make shuttles safer, performed breathtaking in-orbit maneuvers and a first-of-its-kind spacewalking repair.

They also delivered supplies and made repairs to the space station after Discovery docked on July 28. "We know the folks on planet Earth are just feeling great right now," said Discovery Commander Eileen Collins from orbit shortly after launch.

NASA Administrator Michael Griffin praised employees at Kennedy Space Center and other centers during a post-launch press conference in the KSC TV Auditorium. "I want you to think about what it takes to get millions of different parts from thousands of vendors across the country to work together to produce what you saw here today, and to realize how chancy it is, how difficult it is, and what a primitive state of technology it still is," Griffin said. "This team managed to do it, and I think a large debt of appreciation is due to them. They have worked as hard as any team in NASA history."

The STS-114 return to flight mission was the first step in realizing America's Vision for Space Exploration, which calls for a steppingstone strategy of human and robotic missions to achieve new exploration goals.



ABOVE, THE eyes of the world were on Discovery as it lifted off July 26. At left, Kennedy Space Center employees watch Discovery lift off. The mission ended with an Aug. 9 landing at Edwards Air Force Base.

SPACE SHUTTLE Discovery lifts off from Launch Pad 39B on July 26 (above). Below, First Lady Laura Bush, Florida Gov. Jeb Bush (right) and KSC Deputy Director Woodrow Whitlow (second from right) were among the guests at the Banana Creek viewing site.



August

The Mars Reconnaissance Orbiter began its seven-month journey to Mars on Aug. 12 when the Atlas V launch vehicle, 19 stories tall with the two-ton spacecraft on top, roared away from Launch Complex 41 at the Cape Canaveral Air Force Station. The mission will examine Mars in unprecedented detail from low orbit.

Its instrument payload will study water distribution - including ice, vapor or liquid - as well as geologic features and minerals. The orbiter will also support future missions to Mars by examining potential landing

Mars mission begins at Cape

sites and by providing a high-data-rate relay for communications back to Earth.

The first launch of an interplanetary mission on an Atlas V, the powerful first stage consumed approximately 200 tons of fuel and oxygen in just over four minutes, then dropped away to let the upper stage finish the job of putting the spacecraft on a path toward Mars.

The health and other vital information about the spacecraft's subsystems were received through the Japan and the Goldstone, Calif., antenna station of NASA's Deep Space Network. The orbiter successfully fired six engines for about

20 seconds on Nov. 18 to adjust its flight path in advance of its March 10 arrival at the red planet. It will spend half a year gradually adjusting the shape of its orbit, then begin its science phase. During that phase, it will return more data about Mars than all previous missions combined.

The spacecraft has already set a record transmission rate for an interplanetary mission. Visit <http://www.nasa.gov/mro> for updates.



THE MARS Reconnaissance Orbiter launches Aug. 12 from CCAFS. The NASA mission will further develop technologies needed to support future missions to Mars by examining possible landing sites. It is scheduled to arrive at the red planet March 10.

Ferry flight brings Discovery home to KSC



DISCOVERY, ATOP a 747 Shuttle Carrier Aircraft, returns to KSC on Aug. 21.

Space Coast residents were treated to a welcome sight on Aug. 21 - the space shuttle Discovery heading home atop a modified Boeing 747 Shuttle Carrier Aircraft (SCA) after a successful mission. The cross-country ferry flight became necessary when two days of unfavorable weather conditions at KSC forced Discovery to land at Edwards Air Force Base, Calif., on Aug. 9 following STS-114.

The SCA and Discovery were towed to the mate/demate

device at the Shuttle Landing Facility, where a crane lifted the orbiter from the aircraft and placed it on solid ground. Discovery was then towed to the Orbiter Processing Facility, where the Multi-Purpose Logistics Module Raffaello was removed and transferred to the Space Station Processing Facility. Shuttle program managers also determined that Discovery would be used for the next mission, STS-121, instead of Atlantis, which will resume assembly of the space station.

September

Management prepared for Kennedy Space Center's fast-paced future in space exploration by starting a reorganization known as KSC Exploration 2005. Four new offices were created in response to the Exploration Systems Architecture Study. These included the Constellation Projects Office, Engineering Development Office, Applied Technology Office and Advanced Planning Office.

"It will be a huge effort at KSC, on a scope that is probably

Exploration 2005 prepares KSC for future

unprecedented in NASA's history, to fly out shuttle and phase down station while gearing up another program," Center Director Jim Kennedy said. "We want to be prepared to accept this challenge."

Later in the month, NASA Administrator Mike Griffin unveiled concepts of the new exploration vehicle and said the system will lift off from Launch Pads 39A and B. The spacecraft will be designed to carry four astronauts to and from the moon, and the crew vehicle will be shaped like an Apollo capsule, but three times larger.



THE NEW exploration vehicle will lift off from Launch Pads 39A and B, according to NASA Administrator Mike Griffin. The first flights are scheduled between 2012 and 2014, depending on future funding.



MEREDITH CHANDLER of KSC's Engineering Development Directorate, and a FEMA volunteer, met former Pres. George Bush Sr. in Mississippi.

Kennedy employees assist in Hurricane Katrina victim relief

Employees throughout Kennedy Space Center teamed up in September to help Hurricane Katrina survivors from the Stennis Space Center in Mississippi and the Michoud Assembly Facility in New Orleans. The charitable efforts included bringing emergency equipment, food and medical supplies to the sites, and providing medical and emergency personnel, 1,000 gallons of diesel fuel, food and chainsaws.

The storm hit the Gulf coast region Aug. 29 before 26 workers from KSC were trained and sent to disaster recovery centers to assist victims.

Several KSC employees were deployed to assist, including Meredith Chandler, a FEMA volunteer and member of the Engineering Development Directorate, who worked 12-hour days inside a large warehouse in the town of Waveland, Miss. She signed people up for trailers and checked on the status of their FEMA accounts. The area was under more than 15 feet of water during Katrina, according to Chandler. "Every person who comes in has a different story and they want to be heard," Chandler said. "We spend a lot of time trying our best to understand."

Whitlow will be next Glenn Research Center director

Dr. Woodrow Whitlow Jr., deputy director of Kennedy Space Center, was named the next director of the John H. Glenn Research Center in Cleveland. Whitlow, who begins his new post this month, became deputy director of KSC in 2003. He will succeed Julian Earls, who retired. Whitlow previously served at Glenn Research Center as director of research and technology.

Whitlow values the time he spent at KSC and will have many memories. "This is a very fun place to work," he said. "To see everything come together for a mission is very satisfying to me."

"To have a successful launch and mission, and to know that there are scientists, engineers and researchers who spent their entire careers working on a particular scientific instrument and are now gathering data from their life's work is also very exciting and rewarding."



DR. WOODROW Whitlow Jr., deputy director of KSC who will become director of the Glenn Research Center later this month, greets First Lady Laura Bush for the launch of STS-114, while Jim Hattaway, associate director for KSC, looks on.

October

Endeavour powers up with major upgrades



Space shuttle orbiter Endeavour came to life in early October for the first time in two years, bringing cheers throughout Orbiter Processing Facility's bay 2 as the flow of electricity signaled the end of the vehicle's major modification period. Engineers and technicians spent 900,000 hours performing 124 upgrades to the vehicle, including all recommended return-to-flight safety modifications.

This was the second of these modification periods performed entirely at KSC. Two of the more

extensive modifications included the addition of the multi-functional electronic display system, or "glass cockpit," and the three-string global positioning system that improves the shuttle's landing capability.

The "glass cockpit" encompasses a new, full-color, flat-panel display system that improves interaction between the crew and orbiter with easy-to-read graphics portraying key flight indicators like attitude display and mach speed. Endeavour was the last vehicle in the fleet to receive this system.

November

Nearly 2,000 Kennedy Space Center employees and their guests gathered to celebrate the successful return of the STS-114 crew during the inaugural Crew Return Celebration Nov. 1 at the KSC Visitor Complex. Many of the astronauts shared details about their historic return-to-flight mission and signed autographs at the event. Attendees also enjoyed the new 3-D movie *Magnificent Desolation*.

"We are so proud of the employees here at the Kennedy Space Center," STS-114 Commander Eileen Collins said. "We

Employees celebrate STS-114 crew's return

had an extremely successful flight and that is the message we're getting out. We want to thank all of you, the employees and the families, that worked so hard to make it happen."

Collins, along with crew members Charles Camarda and Soichi Noguchi, presented a picture-board memento to the employees and Center Director Jim Kennedy for his leadership to get the shuttle program flying again. Its plaque reads: "To the employees of the Kennedy Space Center in appreciation for your work in Return to Flight," and includes part of the American flag flown on the spacecraft.



MISSION SPECIALIST Steve Robinson (with hat) thanks employees for their work during the successful STS-114 mission.

Space community gathers for Florida Space 2005



NASA ADMINISTRATOR Mike Griffin addresses attendees at the inaugural Florida Space 2005, a conference designed to give the space community an opportunity to discuss future exploration.

Florida's diverse space community came together in November to share ideas at the inaugural Florida Space 2005, a new conference built on the best features of Space Congress and the Cape Canaveral Spaceport Symposium.

The event, conducted by the Space Foundation, drew space professionals from throughout the region to the Kennedy Space Center Visitor Complex to learn about current business opportunities, discuss relevant space policy and network with top experts from KSC, the U.S. Air Force's 45th Space Wing and the Florida Space Authority.

During the three-day event, NASA Administrator Mike Griffin highlighted the role KSC will play in the space exploration program. "KSC is a crown jewel of NASA and the state of Florida," Griffin said. He also stated NASA should avoid a repeat of the period from 1975 to 1981 when the Apollo program ended and a gap existed before the first space shuttle launch.

Florida Lt. Gov. Toni Jennings praised the space program as an important part of our community's fabric. "We have a commitment in Florida to continue our 50-year history of launching space vehicles."

December

Testing neared completion for NASA's New Horizons mission, set for liftoff this month from Launch Complex 41 to unlock one of the solar system's last, great planetary secrets. New Horizons will be the first spacecraft to visit Pluto and its moon, Charon. The compact spacecraft carries a payload of seven science instruments for examining the geology, composition, surface, temperature and atmospheric structure of the planet and its moon.

The spacecraft will then venture deeper into the Kuiper

New Horizons readies for launch to last planet

Belt, an ice dwarf planet and relic of the solar system's formation, to explore how it has evolved over time. Beginning about one month after launch, the various instruments will be turned on to begin testing and to ensure they are operating properly. Instrument calibrations are planned throughout the early and middle portions of 2006, in anticipation of the mission's early-2007 Jupiter flyby on the way to Pluto. During the nearly 10-year voyage to Pluto, the instruments will be checked out every year.



ENGINEERS CHECK the radioisotope thermoelectric generator on NASA's New Horizons spacecraft, scheduled to launch this month.

A look back at Kennedy Space Center in 2005



THE RETURN-to-flight STS-114 crew members head for the bus that will transport them to the launch pad. From left, in front, are Mission Specialists Andrew Thomas, Charles Camarda and Wendy Lawrence, with Pilot James Kelly leading. In back are Mission Specialists Stephen Robinson and Soichi Noguchi and Mission Commander Eileen Collins.



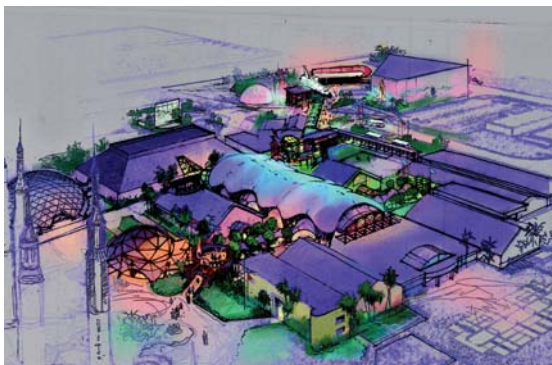
SPACE SHUTTLE Discovery clears Launch Pad 39B on its historic return-to-flight mission STS-114.



FLORIDA GOV. Jeb Bush talks to members of the KSC-sponsored Pink Team before its opening match at the FIRST Robotics Florida Regional held at the University of Central Florida.



DISCOVERY APPROACHES Runway 22 at Edwards Air Force Base in California after completing the successful STS-114 mission.



THE KSC Visitor Complex unveiled plans for a \$160 million project that will add nine new exhibits, including the Shuttle Launch Experience, the first project in the 10-year development plan.



John F. Kennedy Space Center

Spaceport News

Spaceport News is an official publication of the Kennedy Space Center and is published on alternate Fridays by External Relations in the interest of KSC civil service and contractor employees.

Contributions are welcome and should be submitted two weeks before publication to the Media Services Branch, IDI-011. E-mail submissions can be sent to Jeffery.Stuckey-1@ksc.nasa.gov

Managing editor Bruce Buckingham
Editor Jeff Stuckey
Copy editor Corey Schubert

Editorial support provided by InDyne, Inc. Writers Group.
NASA at KSC is located on the Internet at <http://www.nasa.gov/centers/kennedy>
USGPO: 733-049/60098